DOCUMENT RESUME

ED 259 649 HE 018 530

AUTHOR Wheeler, Daniel; Creswell, John
TITLE Developing Faculty as Researchers. ASHE 1985 Annual Meeting Paper.
PUB DATE Mar 85
NOTE 43p.; Paper presented at the Annual Meeting of the Association for the Study of Higher Education (Chicago, IL, March 15-17, 1985).
PUB TYPE Information Analyses (070) -- Speeches/Conference Papers (150)

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS *Career Ladders; *College Faculty; Developmental Stages; Educational Quality; *Faculty Development; Higher Education; Mentors; *Productivity; Professional Development; Reputation; *Researchers; Research Projects; *Scholarship; Teamwork; Work Environment; Writing for Publication
IDENTIFIERS *ASHE Annual Meeting; Faculty Publishing

ABSTRACT

Domains of faculty research development are considered, with attention to various scholarly activities such as publishing in journals, editing books/monographs, publishing book reviews, and delivering papers at professional meetings. A cognitive map of faculty development is presented that incorporates findings from the literature on the sociology of science as well as the literature on career phases/stages of faculty. The sociology of science literature contains a subset of studies on scientific research productivity. Significant correlates of high research performance are identified and organized into individual, organizational, and individual-environmental categories and studies. Specific focus is placed on the following correlates that have been directly related to the faculty career or age literature: sponsorship and mentoring, prestige or quality of instruction, prior productivity, role attrition, collaboration with colleagues, and reinforcement in the workplace. The correlates of productivity are also related to career stage or phase models, including the following periods: graduate preparation, the initial years as faculty member, middle and later years, and retirement and beyond. A bibliography is appended. (SW)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

BEST COPY AVAILABLE

ED259649

DEVELOPING FACULTY AS RESEARCHERS

by

Daniel Wheeler
Faculty Career Consultant
Inst. for Agricultural and
Natural Resources
University of Nebraska-Lincoln

John Creswell
Department of Educational
Administration
University of Nebraska-
Lincoln

"PERMISSION TO REPRODUCE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

John Creswell

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

HE 018530

A contributed paper presentation for the annual meeting of the Association for the Study of Higher Education, Chicago, Illinois, March 15-17, 1985.

ASHE Association for the Study of Higher Education
The George Washington University/One Dupont Circle, Suite 630/Washington, D.C. 20036
(202) 296-2597

This paper was presented at the Annual Meeting of the Association for the Study of Higher Education held at the Palmer House Hotel in Chicago, Illinois, March 15-17, 1985. This paper was reviewed by ASHE and was judged to be of high quality and of interest to others concerned with the research of higher education. It has therefore been selected to be included in the ERIC collection of ASHE conference papers.

Developing Faculty as Researchers

Faculty development in higher education is in transition. The transition is from a focus on instructional improvement activities and workshops to a broader purpose including organizational development and most recently, the development of individual careers (Toombs, 1983). This transition is not unexpected. Blackburn, Pellino, Boberg, and O'Connell (1980) noted five years ago that clear priority was given to instructional improvement goals with little concern for other aspects of the faculty professional life. When faculty were asked what areas they needed professional improvement, though improvement in teaching remained the faculty's number one desire, research oriented activities - - manuscript preparation and publication, proposal writing, and computer use - - ranked second, third, and fourth in universities, and received modest support in liberal arts colleges (Blackburn et al., 1980).

In reality, traditional faculty development activities often include some research activities. Gaff (1975), for example, included in his list of faculty development activities research oriented strategies such as sabbatical leaves, travel to meetings of professional associations and research support. Toombs (1975) argued for the development of faculty as "professionals" in which basic resources support their work, such as secretarial and technical aid, as well as equipment, supplies, and funds for travel. Then, of course, to be successful researchers faculty must possess basic research method skills in identifying significant problems of study, appropriate theoretical

rationales, and research designs. But, in spite of these points, studies of research oriented activities in faculty development (a) fail to consider activities beyond traditional sabbatical leaves, grants workshops, and travel to research conferences and (b) integrate results from sociology of science studies of predictive correlates of scholarly performance and (c) from the developmental literature on career phases or stages of faculty.

This study makes a unique contribution to the literature by addressing these deficiences. We present a cognitive map of faculty development that incorporates significant findings from the sociology of science and the developmental faculty career literature. Further, we extend prior discussions of faculty development by directing attention to "faculty research development" and activities to be initiated by faculty themselves or by administrators in units in postsecondary education institutions.

Throughout our discussion we will imply that "research" can be defined broadly to include an array of scholarly activities such as submitting an article for publication in an academic or professional journal; publishing an article in an academic or professional journal; publishing or editing, alone or in collaboration, a book or monograph; publishing a book review; or delivering a paper at a professional meeting (Pellino, Blackburn, & Boberg, 1984). These activities are not exhaustive, nor sensitive to discipline areas. Further, the empirical studies in the scientific productivity literature focus almost exclusively on publication and citation counts as measures of research productivity (Creswell, in press). In addition, we will define

"faculty development" in a broad sense to include "program activities, practices, and strategies that aim both to maintain and to improve the professional competence of individual faculty members" (Mathis, 1982, p. 646).

Scholarly Studies of Faculty Research Performance

Our first step in mapping the domains of faculty research development is to briefly review the faculty or scientific productivity literature and identify concepts that vary with chronological or professional age (e.g., number of years experience in higher education).

The sociology of science literature contains a subset of studies on scientific research productivity. The productivity studies probably originated with the work of Robert Merton at Columbia in the 1940's who studied the social structure of institutions and the general orientations characterizing its participants (Storer, 1973). Specifically, Merton examined the norms associated with scientific work in science and patterns of competition among scientists, the reward structure of science, scholarly refereeing, and inequality in scientific performance (Merton & Gaston, 1977). This work spawned numerous studies of scientific performance, including Zuckerman's (1977) study of Nobel Laureates; Cole and Cole's (1973) examination of social stratification in science; Crane's (1965) analysis of productivity and scholarly recognition; Gaston's (1978) study of reward systems; and Hagstrom's (1965) work on scientific communities.

In recent years Wanner, Lewis, and Gregorio (1981), Boberg

and Wanner (1984), Fox (1983), and Creswell (in press) synthesized the scientific productivity literature and identified predictive correlates of high research performance. From these syntheses, as well as from empirical studies, one can assemble a reasonable list of significant correlates of high research performance. Table 1 presents these correlates and organizes

---

Insert Table 1 Approximately Here

---

them into individual, organizational, and individual-environmental categories and studies. From this array of correlates, we would like to direct attention to several of them that have been directly related to the faculty career or age literature.

Sponsorship and Mentoring

Though sponsors and mentors are present throughout the careers of academics, we will direct attention to their role during the formative years of a faculty career, during graduate training, because the productivity literature addresses this phase. Cameron and Blackburn (1981) operationalized sponsorship as the assistance faculty give graduate students in financial support, placement support, publication support, emotional support, sponsored research support, dissertation funding, first job placement, and early collaboration on manuscripts. Reskin (1979) and Long (1978) found the effects of sponsors and mentors to be an important influence on the research performance of individuals during the predoctoral phase of training and in the early years after receipt of the doctorate. The effects of

sponsorship are not sustained in the long term productivity of scholars. In a longitudinal model of research performance, Long (1978) explained away much of the influence of a mentor during graduate training by the prestige of the department in which the student later became employed. Thus, one would expect the graduate school mentor to directly influence the predoctoral and early publication efforts of scholars in their careers, but not to have sustained effects much beyond a three to six year period after graduation.

Prestige or Quality of Institution

Though the point cannot be as convincingly made today as ten or fifteen years ago, faculty climb the status hierarchy by a succession of moves toward a higher and higher quality institution or program. In the productivity literature, the prestige of the institution shapes and even stimulates individual research performance. Biochemists attain positions largely due to factors related to graduate education, sponsorship, and postdoctoral study (Long, 1978). Once a position in a prestigious institution is attained, the correlation between productivity and prestige of the department grows larger over time. Then, when a faculty member moves, the effects of the prior department decrease, and the influence of the new department increases markedly within five years (Long, 1978). Long and McGinnis (1981) support this finding in their study of individuals adjusting to the characteristics of a particular work context. Thus, the quality or prestige of the employing institutions significantly correlates with faculty research

performance during careers.

Prior Productivity

A key element in a productive research career is the establishment of the "habit" of research performance early in one's career (Blackburn, Behymer, & Hall, 1978). Lightfield (1971) has established that sociologists who are highly published and cited during the first five years following receipt of the doctorate, continued to publish during a second five year period. This result prompted Lightfield (1971) to write: "Unless a person achieves a qualitative piece of research during his first five years as a sociologist . . . it seems unlikely that he will do so during his next five years - - if at any time during his career" (p. 133). For chemists, Reskin (1979) determined that early productivity as measured by number of articles published during the third, fourth, and fifth years after receipt of the Ph.D. highly predicted the number of articles after a decade. For physicists, Cole and Cole (1967) established that few scholars who start their careers off slowly as producers ever become highly productive researchers during their professional life. This research implies that faculty early in their careers should begin publishing and develop a "habit" of writing and scholarly work if they aspire to high productivity levels later in their careers.

Role Attrition

The attrition of the research role and the enlargement of teaching, administrative, and other faculty roles occurs earlier and more frequently among faculty who publish little research than those who publish extensively (Zuckerman & Merton, 1973).

Conversely, faculty who publish extensive research often remain well published throughout their careers (Blackburn, 1979; Creswell, Patterson, & Barnes, 1984). Authors explain these trends in research role attrition by shifts in faculty interest or orientation toward research and faculty time spent on research.

When Fulton and Trow (1974) examined the relationship between faculty interest in research (i.e., exclusively teaching oriented to strongly research oriented) and research productivity, they found faculty interest in research to peak at the age of the early 30's, and thereafter steadily and slowly decline. The percentage of "exclusive teachers" doubles, and "strong researchers" halves between the ages of 35-56. A similiar attrition away from research also holds true when one examines the amount of time spent on research. Knorr, Mittermeir, Aichholzer, and Waller (1979) found age, as measured by chronological age and number of years of professional experience, and amount of time spent on research to be negatively correlated; and age and amount of time spent on administration to be positively correlated. They attributed these findings to the role attrition of unproductive scientists into teaching, administration, and other work. That this phenomena occurs was empirically established by Creswell, Barnes, and Patterson (in press) who identified in the national Ladd and Lipset Survey of the American Professoriate a trend of low research producers to decline markedly in their research performance during the period of 11 to 20 years of experience and to increase in the number of

hours weekly they spent on administrative responsibilities. Thus, relating these findings to a career of an academic, one might expect that, at the mid-career phase, faculty who have had relatively little success in research and publications to turn to other activities in the academy or to consider leaving the academy (Patton & Palmer, 1981).

Collaboration with Colleagues

Thoughout a faculty career, colleagues within and outside institutions are important for collaboration and for encouraging faculty to engage in research activities. Pelz and Andrews (1966) determined that highly productive scholars were those who maintained frequent contact with colleagues, spent time communicating with them, and needed little assistance from others to be productive. Recent studies add further insight. Braxton (1983), for example, in a study of chemistry and psychology professors in liberal arts colleges, found departmental colleagues' productivity to indirectly influence an individual's performance. Department colleagues' publication rates have the greatest influence on individual publication productivity when the individual's rate is low and the least influence when the rate is high. Thus, he concluded that departmental colleagues tend to stimulate or repress productivity, but make little difference for high producers.

Though Braxton directed attention to departmental colleagues, Finkelstein (1982) examined collegial interaction with department colleagues, extra-departmental campus colleagues, and off-campus disciplinary colleagues for faculty in a private university and two liberal arts colleges. He discovered

productive faculty to combine strong off-campus collegial functioning with strong departmental interactions and relative insulation from extra-departmental campus colleagues. Thus, he called attention to the importance of on- and off-campus colleagues in the life of productive scholars.

Colleagues are an important source of information for productive scholars. Parker, Lingwood, and Paisley (1968) explored the relationship between communication behavior and research productivity for "communication researchers" and National Science Foundation's 1966 National Register of Scientific and Technical Personnel. Communication behavior is defined as interpersonal contact, including receipt of reprints and unpublished papers; telephone conversations; personal contact, visits, telephone or correspondence contact with major research facilities; and conversation, correspondence, or unpublished papers as a source of recent useful information. It is also defined as impersonal contact, including journal readership, use of reprints, contact with major research facilities and formal meeting presentations. Though the results showed interpersonal contacts to be a more precise predictor of productivity than impersonal contacts, only 31% of the variance in productivity is accounted for by the predictors in a regression model. Thus, productive research scholars can be expected, from the time of their initial appointment as faculty throughout their career, to be in continuous contact with individuals working on a similiar research thrust.

Reinforcement in the Workplace

The workplace exercises a strong influence on the research performance of faculty. In fact, it has been characterized as perhaps the strongest influence of all (Cameron & Blackburn, 1981). Individuals can be encouraged to research by the attitudes of faculty in the department toward research. McKeachie (1983) reviewed job related events than can result in lowered productivity: department chairs or administrators who are critical and unappreciative of good work, incompatible colleagues, and lack of respect by others for what one is doing. Informal recognition may be given to faculty for published works. Gaston (1978) and Reskin (1977) attributed high research performance to the immediate reinforcement that researchers received from colleagues above and beyond the recognition resulting from citations to works. Reskin (1977) acknowledged that informal recognition may even be more important than formal recognition, and given the reward structure of most university departments, the act of publishing, by itself, may be especially reinforcing to university scientists.

Another little explored aspect of the work environment is the work habits of faculty. Stinchcombe (1966), for example, argued that researchers' concepts of self are intimately related to their work, and because scholarly work is nonroutine, difficulties in research are likely to appear due to loss of personal motivation. This loss of motivation, Stinchcombe further suggests, can be offset by a researcher carrying on research on several topics simultaneously. Thus, if one research project falters, other projects are available to maintain one's

interest. To this perspective can be added Simon's (1974) argument that eminent scholars suffer periods of difficulty in their research because they are tackling difficult subjects. Thus, when difficulties are encountered, periods of being "hung-up" result (Hargens, 1978), and even eminent scholars become less productive. Simon (1974) attributed these periods to physical illness and fatigue, causing a loss of work time ranging from three to four days every couple of months to a few days once a year.

An empirical test of the simultaneous projects and "hung-up" hypotheses was made by Hargens (1978) in a study of chemists, mathematicians, and political scientists. Using publication rates, faculty who worked on simultaneous topics published larger quantities of research than those who did not. Thus, one can ascribe importance to the work environment in shaping the research behavior of faculty, especially during the formative and middle years of a career.

Relating Correlates of Productivity to Career Stages

We next reviewed the career stage or phase models to identify faculty career events and specific faculty development activities related to the productivity correlates. Careers include life span activities and may involve many different jobs (Mathis, 1979). Developmental psychologists describe how one's life structure during a career consists of a series of alternating stable and transitional periods (Levinson, 1978). Though these periods are based on the traditional career development of white males, efforts to map individual attitudes,

issues, and specific tasks during these periods are available in recent literature. For example, Baldwin and Blackburn (1981) use a five stage model based on academic ranks and the number of years of college teaching experience, to identify stable, evolving, and fluxuating faculty attitudes along organizational, teaching, scholarly, and personal dimensions. Ralph (1973) identifies a five-stage model of developmental stages about how individuals think about personal, educational, and professional goals. Braskamp et al. (1984) discuss how assistant, associate and full professors differ in achievement, sources of intrinsic and extrinsic motivation, and career goals and aspirations. Mathis (1979) identifies four key intervention points for faculty development efforts: the graduate preparation of the future faculty member, the initial years of a faculty member's first appointment, the middle and latter years of a career, and the near retirement years. And Schein (1978) identifies nine career cycles of individuals and issues and specific tasks to be confronted.

Though each career stage model enlightens our understanding of faculty careers, we will use the Mathis' (1979) four functional stages because it is simple and directs attention to intervention strategies for faculty development by faculty themselves and by administrators and committees in academic units. It is hypothesized, then, that at four stages in academic careers, important career events occur which can be related to correlates of scientific productivity. These career events, in turn, provide a basis for projecting faculty development research activities faculty can engage in and administrators can

facilitate. Table 2 presents this general schema and will be used as a frame of reference for the narrative to follow.

Insert Table 2 Approximatey Here

Intervention During Graduate Preparation

Preparation for a faculty career is strongly shaped by graduate school. It is there that prospective faculty are socialized to the norms, expectations, and sanctions of a faculty career. Schein (1978) would characterize this career cycle stage as "basic training" in which a graduate student faces the issues of (a) dealing with the reality shock of what work and membership are really like (b) becoming an effective member as quickly as possible (c) adjusting to the daily routines of work and (d) achieving acceptance as regular contributing member - - passing the next inclusion boundary.

It has been shown that advantages first accrue to high performers at the graduate school phase of their career. Those individuals who select prestigious departments or institutions in which to obtain their advanced degrees gain initial advantages towards a research career by working with distinguished scientists and collaborating with them on research projects (Cameron and Blackburn 1981; Crane 1965; Long 1978). Thus, prospective faculty can improve their chance of a productive research career by the choice of a prestigious graduate program, and by affiliating early in their careers with mentors or sponsors who can help them attain financial assistance for their

program, collaborate with them on manuscripts, and assist them in obtaining key faculty positions in leading institutions following graduation. Additionally mentees can look for other forms of support mentioned by Cameron and Blackburn (1981) such as providing sponsorship on research projects, dissertation funds, and emotional support from sponsors or advisors.

Graduate students from prestigious doctoral programs are more productive researchers than students from less prestigious programs (Crane 1965). Deans and department chairs should seek applicants for positions from prestigious programs by reviewing quality ratings of doctorate granting departments listed in the five volume Assessment of Research-Doctorate Programs in the United States published by the Committee on an Assessment of Quality-Related Characteristics of Research-Doctorate Programs in the United States (Webster,1983). Granted, some institutions may not have the resources to hire graduates from the best graduate programs. Still, an attempt should be made to contact graduates from outstanding programs (or mentees from outstanding scholars in less prestigious programs) because they hold an initial advantage toward a productive research career over graduates from lesser institutions.

Initial Years

Faculty in the initial years hold short term, self-directed goals to succeed as a faculty member and get promoted at the institution (Braskamp et al., 1984). New faculty find themselves receptive to assistance from more experienced colleagues as they begin to understand the informal operations and power structure of their organization (Baldwin & Blackburn, 1981). New faculty

are also balancing their own needs with the needs of the organization: they are often evaluated frequently and under a state of subordination and dependence (Schein, 1978).

These factors hold important implications for faculty research development. For example, we know that individuals who produce early in their careers become productive researchers throughout their careers (Cole & Cole 1973; Lightfield, 1971). Therefore, faculty should make a concerted effort to publish soon after they finish graduate school and assume their first faculty position. Then, after a short period, faculty energies may become diverted away from research into teaching and service. The reward system is based heavily on research; however, course preparations, student advisement, and departmental committees consume large amounts of time. Though these activities are valuable, they detract from work on manuscripts and from the development of the "habit of writing" (Blackburn, Behymer, & Hall, 1978). New faculty would do well to establish this "habit" early and begin submitting manuscripts early in their careers.

To be productive researchers, new faculty need time assigned to their faculty load for research (Allison & Stewart, 1974). Oddly enough, this simple point is often overlooked by faculty and administrators. The time assigned need not be excessive. Knorr et al. (1979) maintained that the time should not exceed 80% or be less than 20%; somewhere in the range of 40% is probably ideal. Other resources than time are important, too. Adequate computer time, research assistants, and secretarial services are resources valuable in a productive research career.

Middle and Later Years

During the middle and later years faculty typically move through the ranks of associate professor and on to full professor. Much has been written about the transition period of the middle years. Associate professors have been successful at meeting critical hurdles of their professional life, they search for a more balanced view of their lives, and they form a professional life style based on their schedule of work and the rewards they seek (Braskamp et al., 1984). At the senior associate professor or early full professor stage, a mid-career crisis may set in, characterized by a nagging fear that careers have plateaued, that there is little room to advance professionally (Baldwin & Blackburn, 1981). In this phase, a major reassessment is undertaken, and decisions are made to scale down ambitions, change careers, or forge ahead to new challenges (Schein, 1978). But gradually reassessments are termin ted and new life structures built. Faculty reach a stage where they may have reduced environmental pressures, seek to make a contribution to their profession, and serve as role models or mentors to new faculty. The goals and aspirations of full professors reflect their concern about the type of contributions they want to make to society. In research, they may write the integrative piece in their field or apply their knowledge in new ways, and they question the emphasis placed on quantity and not quality of publications (Braskamp et al., 1984). If they are not full professors, they may accept reduced influence and challenge and seek growth outside career and work (Schein, 1978). At this stage, faculty become mentors and learn to influence others and

be responsible for others (Schein, 1978).

This sketch of characteristics and experiences of faculty in mid and late career is far from complete. Still, from these brief descriptions of experiences, we can draw several conclusions about research development activities.

At the mid and later years phase, faculty experience a strong need for colleague and unit (i.e., department) support for research. At these time, faculty should maintain research contacts with colleagues pursuing similiar research at other institutions and in your own institution. Faculty contacts with colleagues are extremely important in a flourishing research career (Braxton, 1983; Finkelstein, 1982; Parker, Lingwood, & Paisley, 1968), and contact should be maintained on a continuous basis through letters, phone calls, and annual conferences. These contacts not only provide encouragement for research ideas but also assist in collaboration, journal editorial board appointments, and a better understanding of the larger body of literature on the subject.

The attitude and atmosphere of a department or college is important in stimulating high productivity among faculty (McKeachie, 1983). Becker (1977) commented:

> Sincerely expressed interest in what the researchers are doing, sympathy for their problems, and sincere praise for what they feel are breakthroughs they have made are bound to encourage further productive activity (p.21).

Department chairs and administrators who are appreciative of good work and respect the research performance of faculty provide an

environment stimulating for researchers. Some department chairs can role model high research performance, and senior colleagues can collaborate or assist junior faculty in research. Department goals and objectives can be oriented toward research; faculty can share outstanding research achievements with colleagues in department meetings, lists of publications can be developed and updated annually for departments and colleges. These efforts attest to a supportive environment where value is placed on research.

The high research producers are individuals who maintain a continuous line of research during their careers. And they continue to produce throughout their careers without experiencing a mid-career slump in performance (Creswell, Patterson, & Barnes, 1984). This suggests that a distinct line of inquiry should be initiated by all individuals who aspire to high performance, and this inquiry should be a sustained effort to last five or more years. In this way, faculty maintain an overarching structure or continuity in research during times of personal stress or crisis.

Faculty should also expect periods of being "hung-up," periods in which a research theme stalls out temporarily or becomes less productive or may even be abandoned. For example, scientists in experimental research may turn from the study of rats to people and vice versa. In these difficult periods, faculty can pursue simultaneous projects because one may reach an impasse or become tiring (Hargens, 1978).

Faculty are reminded of the reinforcement process of publishing itself. Faculty who publish are encouraged to continue publishing (Fox, 1983), and one cannot overestimate the

importance of being cited for worthwhile publications, being contacted for reprints of articles, and being sought out by graduate students who seek to replicate or extend works. The influence of the printed word is powerful, as accomplished researchers can testify.

Retirement and Beyond

Retired individuals may be our greatest national resource in the next few decades (Mathis, 1979). Retired person who wish to remain active with institutions should be accorded the full amenities of a professional life, such as a parking space, a library permit, a mailbox, and other incentives that permit participation in the academy. According to Schein (1978), two issues confront the individual during "passage out of the organization or occupation": adjusting to more drastic changes in life style, role, standard of living; and using one's accumulated experience and wisdom for others in various senior roles.

The implications of these experiences for the research development of faculty are several. Retired faculty should be encouraged to participate in faculty development activities; and, those who have remained active as researchers throughout their career, can serve as senior mentors in such activities. It is known that productive researchers remain productive throughout their careers with only a slight decline in performance as retirement nears (Baldwin, 1979). Further, administrators can assign retired faculty to research projects and to important roles in workshops and development activities.

Summary

Faculty development activities involve both the individual improvement of faculty as well as structured activities and events under the direction of unit administrators. When faculty development is broadly conceived to include research development, the range of activities expands to include more than the traditional sabbatical leaves and grants programs. Specifically, the scientific productivity literature suggests select correlates likely to enhance research performance and several of these correlates seem to impact faculty careers at different stages.

It remains then to couple the correlates with the career stage literature so that development activities are responsive to the developmental conception of faculty careers. What emerges from this coupling is a different set of activities and options available to faculty and administrators to improve the research performance of faculty. Specifically, mentoring, role assignments, colleagues, departmental attitudes and such assume greater importance. Thus, it is not only grants workshops and monies for research conferences that are important, but also a host of activities individuals themselves can undertake and unit administrators can facilitate. Moreover, these activities can be conceptualized within a "developmental perspective" (Baldwin & Blackburn, 1981) so that development activities can be tailored to meet individual needs.

Though additional research needs to be conducted on predictive correlates of high research performance and on the validity of career stage events and experiences, this analysis is

a point of departure for future studies about research oriented activities for faculty specifically, and for a larger reconceptualization of faculty development to include research development.

REFERENCES

Allison, Paul D., and Stewart, John A. August 1974. "Productivity Differences Among Scientists: Evidence for Accumulative Advantage." American Sociological Review 39: 596-606.

Astin, Helen. 1978. "Factors Affecting Women's Scholarly Productivity." In The Higher Education of Women: Essays in Honor of Rosemary Park, edited by Helen Astin and Werner Z. Hirsch, pp. 133-157. New York: Praeger Publishers.

Babchuk, Nicholas, and Bates, Alan P. May 1962. "Professor or Producer: The Two Faces of Academic Man." Social Forces 40: 341-348.

Baldwin, Roger G. 1979. "Adult and Career Development: What are the Implications for Faculty?" In Current Issues in Higher Education, 1979. Washington D.C.: American Association for Higher Education.

Baldwin, Roger G., and Blackburn, Robert T. November-December 1981. "The Academic Career as a Developmental Process." Journal of Higher Education 52(6): 598-614.

Bayer, Alan E., and Dutton, Jeffrey E. May-June 1977. "Career Age and Research-Professional Activities of Academic Scientists." Journal of Higher Education 48:259-282.

Bayer, Alan E., and Folger, John. 1966. "Some Correlates of a Citation Measure of Productivity in Science." Sociology of Education 39: 381-390.

Becker, H. 1977. "Productivity Issues in Research: The Personal Perspective of One Researcher." In Proceedings of a National Conference on Productivity and Effectiveness in Educational Research and Development, pp. 20-24. Philadelphia, PA: Research for Better Schools, Inc. ED 151 971. 76 pp. MF HC.

Biglan, Anthony. June 1973. "The Characteristics of Subject Matter in Different Academic Areas." Journal of Applied Psychology 57(3): 195-203.

Blackburn, Robert T. 1979. "Academic Careers: Patterns and Possibilities." In Current Issues in Higher Education, 1979. Washington D.C.: American Association for Higher Education.

Blackburn, Robert T.; Behymer, Charles E.; and Hall, David E. April 1978. "Research Notes: Correlates of Faculty Publications." Sociology of Education 51: 132-141.

Blackburn, Robert T., and Havighurst, Robert J. September 1979. "Career Patterns of U.S. Male Academic Social Scientists." Higher Education 8(5): 553-572.

Blackburn, Robert T.; Pellino, Glenn R.; Boberg, Alice; and O'Connell, Coleman. 1980. "Are Instructional Improvement Programs Off-Target?" In Current Issues in Higher Education, 1980. Washington D.C.: American Association for Higher Education.

Boberg, Alice, and Wanner, Richard A. 1984. "Design for a National Study of Faculty Research Productivity in Canada." Paper presented at the joint meeting of AERA/ASHE, San Francisco, California.

Brashkamp, Larry A., Fowler, Deborah L. and Ory, John C. Spring 1984. "Faculty Development and Achievement: A Faculty's View." Review of Higher Education 7(3): 205-222.

Braxton, John M. Winter 1983. "Department Colleagues and Individual Faculty Publication Productivity." The Review of Higher Education 6(2): 115-128.

Cameron, Susan W., and Blackburn, Robert T. July-August 1981. "Sponsorship and Academic Career Success." Journal of Higher Education 52(4): 369-377.

Clemente, Frank. September 1973. "Early Career Determinants of Research Productivity." American Journal of Sociology 79(2): 409-419.

Cole, Stephen. January 1979. "Age and Scientific Performance." American Journal of Sociology 84: 958-977.

Cole, John R., and Cole, Stephen. 1973. Social Stratification in Science. Chicago: The University of Chicago Press.

Cole, Stephen, and Cole, John R. June 1967. "Scientific Output Recognition: A Study in the Operation of the Reward System in Science." American Sociological Review 32:377-390.

Collins, W. Andrew. March 1971. "Identifying and Fostering Productive Researchers: An Occasional Paper from ERIC at Stanford." Palo Alto, CA: Stanford University ERIC Clearinghouse on Educational Media and Technology. ED 047 538. 33 pp. MF PC.

Crane, Diane. October 1965. "Scientists at Major and Minor Universities: A Study of Productivity and Recognition." American Sociological Review 30: 699-714.

Creswell, John W. (in press) "Understanding Faculty Research Productivity: From Research to Practice."

Creswell, John W.; Barnes, Michael W.; and Wendel, Fred. 1982. "Correlates of Faculty Research Productivity." Paper presented at the annual meeting of the American Educational Research Association, New York, New York.

Creswell, John W.; Patterson, Robert A.; and Barnes, Michael W. 1984. "Low and High Research Producers: A Career Perspective." Paper presented at the annual meeting of the American Educational Research Association, New Orleans, Lousiana.

Creswell, John W.; Barnes, Michael W.; and Patterson, Robert A. (in press). "Correlates of Research Productivity: A Career Age Perspective."

Finkelstein, Martin J. 1982. "Faculty Colleagueship Patterns and Research Productivity." Paper presented at the annual meeting of the American Educational Research Association, New York, New York.

Folger, John K.; Astin, Helen S.; and Bayer, Alan E. 1970. Human Resources and Higher Education: Staff Report of the Commission on Human Resources and Advanced Education. New York: Russell Sage Foundation.

Fox, Mary Frank. May 1983. "Publication Productivity Among Scientists." Social Studies of Science 13(2): 285-305.

Fulton, Oliver, and Trow, Martin. Winter 1974. "Research Activity in American Higher Education." Sociology of Education 47: 29-73.

Gaff, Jerry G. 1975. Toward Faculty Renewal. San Francisco: Jossey-Bass Publishers.

Gaston, Jerry. 1978. The Reward System in British and American Science. New York: John Wiley and Sons.

Gmelch, Walter H.; Wilke, Phyllis Kay; and Lovrich, Nicholas P. 1984. "Sources of Stress in Academe: Factoral Dimensions of Faculty Stress." Paper presented at the annual meeting of the American Education Research Association, New Orleans, Lousiana.

Hagstrom, Warren O. 1965. The Scientific Community. New York: Basic Books.

Hargens, Lowell L. February 1978. "Relations Between Work Habits, Research Technologies, and Eminence in Science." Sociology of Work and Occupations 5: 97-112.

Hargens, Lowell L.; McCann, James C.; and Reskin, Barbara F. September 1978. "Productivity and Reproductivity: Fertility and Professional Achievement Among Research Scientists." Social Forces 57(1): 154-163.

Holley, John W. 1977. "Tenure and Research Productivity." Research in Higher Education 6: 181-192.

Horowitz, Stephen M.; Blackburn, Robert T.; and Edington, Dee W. 1984. "Some Correlates of Stress with Health and Work/Life Satisfaction for University Faculty and Administrators." Paper presented at the annual meeting of the Association for the Study of Higher Education, Chicago, Illinois.

Hunter, Deborah E., and Kuh, George D. 1984. "A Profile of Prolific Scholars in Higher Education." Paper presented at the annual meeting of the American Educational Research Association, New Orleans, Lousiana.

Knorr, Karin D.; Mittermeir, Roland; Aichholzer, Georg; and Waller, Georg. 1979. "Individual Publication Productivity as a Social Position Effect in Academic and Industrial Research Units." In Scientific Productivity: The Effectiveness of Research Groups in Six Countries, edited by Frank M. Andrews, pp. 55-94. Cambridge: Cambridge University Press.

Lehman, Harvey C. 1953. Age and Achievement. Princeton, New Jersey: Princeton University Press.

Levinson, D. J. 1978. The Seasons of Man's Life. New York: Ballatine Books.

Lightfield, E. Timothy. May 1971. "Output and Recognition of Sociologists." The American Sociologist 6: 128-133.

Long, John S. December 1978. "Productivity and Academic Position in the Scientific Career." American Sociological Review 43: 889-908.

Long, John S., and McGinnis, Robert. August 1981. "Organizational Context and Scientific Productivity." American Sociological Review 46: 422-442.

Manis, Jerome G. March 1951. "Some Academic Influences Upon Publication Productivity." Social Forces 29: 269-272.

Mathis, B. Claude. 1979. "Academic Careers and Adult Development: A Nexus for Research." In Current Issues in Higher Education, 1979. Washington D.C.: American Association for Higher Education.

Mathis, B. Claude. 1982. "Faculty Development." In Encyclopedia of Educational Research, edited by H.E. Mitzel, pp. 646-655. New York: The Free Press.

McKeachie, Wilbert J. December 1983. "Faculty as a Renewable Resource." In College Faculty: Versatile Human Resources in a Period of Constraint, edited by Roger G. Baldwin and Robert T. Blackburn, New Directions for Institutional Research Number 40, pp. 57-66, San Francisco: Jossey-Bass, Inc., Publishers.

Meltzer, Bernard. July 1949-50. "The Productivity of Social Scientists." American Journal of Sociology 55: 25-29.

Merton, Robert K. and Gaston, Jerry. 1977. The Sociology of Science in Europe. Carbondale, Illinois: Southern Illinois University Press.

Neumann, Yoram. May 1979. "Research Productivity of Tenured and Nontenured Faculty in U.S. Universities: A Comparative Study of Four Fields and Policy Implicaitons." The Journal of Educational Administration 17: 92-101.

Over, Ray. September 1982. "Does Research Productivity Decline with Age?" Higher Education 11(5): 511-520.

Parker, Edwin B.; Lingwood, David A.; and Paisley, William J. July 1968. Communication and Research Productivity In an Interdisciplinary Behavioral Science Research Area. Stanford University California Institute for Communication Research. Springfield, Virginia: U.S. Department of Commerce, National Technical Information Service.

Patton, David D., and Patton, Carl V. 1981. "Mid-Career Change Options in Academe." Journal of Higher Education 52(4): 378-398.

Pellino, Glenn R.; Blackburn, Robert T.; and Boberg, Alice. 1984. "The Dimensions of Academic Scholarship: Faculty and Adminstrator Views." Research in Higher Education 20(1): 103-115.

Pelz, Donald C., and Andrews, Frank M. 1966. Scientists in Organizations. New York: Wiley.

Ralph, Norbert. 1973. "Stages of Faculty Development." In Facilitating Faculty Development, New Directions for Higher Education, Vol. 1, No. 1. Jossey-Bass, Inc.

Reskin, Barbara F. June 1977. "Scientific Productivity and the Reward Structure of Science." American Sociological Review 42: 491-504.

- - -. July 1979. "Academic Sponsorship and Scientists' Careers." Sociology of Education 52: 129-146.

Roe, Anne. 1953. The Making of a Scientist. New York: Dodd, Mead, and Company.

Schein, Edgar. 1978. Career Dynamics: Matching Individual and Organizational Needs. New York: Addison-Wesley.

Simon, Rita James. August, 1974. "The Work Habits of Eminent Scholars." Sociology of Work and Occupations 1(3): 327-335.

Stinchcombe, A. L. 1966. "On Getting 'Hung-up' and Other Assorted Illnesses." Johns Hopkins Magazine Winter: 25-30.

Storer, Norman. 1973. "Introduction." In The Sociology of Science: Theoretical and Empirical Investigations, edited by Robert K. Merton, pp. xi-xxxi. Chicago: The University of Chicago Press.

Taylor, Calvin W., and Ellison, Robert L. 3 March 1967. "Biographical Predictors of Scientific Performance." Science 155 (3765): 1075-1080.

Toombs, William. November-December 1975. "A Three-Dimensional View of Faculty Development." Journal of Higher Education 46(6): 701-717.

Toombs, William. 1983. "Faculty Development: The Institutinal Side." In College Faculty: Versatile Human Resources in a Period of Constraint, edited by Roger G. Baldwin and Robert f. Blackburn, New Directions for Institutional Research Number 40, pp. 85-94, San Francisco: Jossey-Bass, Inc., Publishers.

Wanner, Richard A.; Lewis, Lionel S.; and Gregorio, David I. October 1981. "Research Productivity in Academia: A Comparative Study of the Sciences, Social Sciences, and Humanities." Sociology of Education 54: 238-253.

Webster, David S. May-June 1983. "America's Highest Ranked Graduate Schools, 1925-1982." Change 15(4): 14-24.

Zuckerman, Harriet. 1977. Scientific Elite: Nobel Laureates in the United States. New York: The Free Press.

Zuckerman, Harriet, and Merton Robert K. 1973. "Age, Aging and Age Structure in Science." In Sociology of Science, edited by Robert K. Merton, pp. 495-559. Chicago: The University of Chicago Press.

TABLE 1

CORRELATES RELATED TO FACULTY RESEARCH PRODUCTIVITY

Dimension	Variables	Select Studies
Individual Correlates	Intelligence scores	Bayer and Folger (1966); and Folger, Astin, and Bayer (1970)
	Motivation	Gaston (1978); Hunter & Kuh (1984); and Pelz & Andrews (1966)
	Personality characteristics	Fox (1983); Roe (1953); and Taylor & Ellison (1967)
	Age	Bayer and Dutton (1977); Blackburn and Havighurst (1979); Cole (1979); Creswell, Patterson and Barnes (1984); Lehman (1953); Over (1982); and Pelz & Andrews (1966)
	Gender	Astin (1978); Babchuk and Bates (1962); Blackburn, Behymer, and Hall (1978); Cameron and Blackburn (1981); Folger, Astin, and Bayer (1970); and Hargens, McCann and Reskin (1978)
Organizational Correlates	Prestige of Doct. Program	Crane (1965) Reskin (1979)

Table 1 (Cont'd)

Dimension	Variables	Select Studies
	Sponsorship and Mentoring	Cameron and Blackburn (1981); Long (1978); and Reskin (1979)
	Prestige of Employing Institution	Crane (1965); and Long and McGinnis (1981)
	Resources and Assignment	Allison and Stewart (1974); Knorr et al. (1979); and Pelz and Andrews (1966)
	Colleagues	Braxton (1983); Collins (1971); Finkelstein (1982); Parker, Lingwood and Paisley (1968); and Pelz & Andrews (1966)
	Academic Rank & Tenure	Blackburn, Behymer, and Hall (1978); Creswell, Patterson and Barnes (1984); Holley (1977); and Neumann (1979)

Table 1 (Cont'd)

Dimension	Variables	Select Studies
Individual-Environmental Correlates	Early productivity	Blackburn, Behymer, and Hall (1978); Clemente (1973); Cole & Cole (1973); Lightfield (1971); Manis (1951); Meltzer (1949-50); and Reskin (1979)
	Preference for Research	Blackburn, Behymer and Hall (1978); and Creswell, Barnes, and Wendel (1982)
	Discipline differences	Biglan (1973); Creswell, Barnes, and Wendel (1982); and Wanner, Lewis, and Gregorio (1981)
	Stress	Gmelch, Wilke and Lovrich (1984); Horowitz, Blackburn, and Edington (1984); and McKeachie (1983)

TABLE 2

Activities Supportive of Research Faculty Careers

Career "Stages"	Career Events	Research-Related Activities	
		Faculty Member	Administration
I. Graduate Preparation	Choice of Program		
II. Initial Years	Short-term Specific Goals		
III. Middle and Later Years	Multiple Research Agenda		
IV. Retirement and Beyond	Adjusting to Drastic Role Changes		

Sources: Levinson (1978); Erickson (1950); Mathis (1979)

D. Wheeler/J. Creswell 3/1985

TABLE 2 (CONT'D)

Appendix A--Activities Supportive of Research in Faculty Careers

Career "Stage"	Career Events	Research-Related Activities	
		Prospective Faculty	Administration and Search Committee
I. Graduate Preparation	*choice of program	*select quality program and/or individual researcher	*provide descriptions of attributes and accomplishments of university college and department
	*socialization to the profession --norms --expectations --sanctions	*identify and work with mentor/advisor	*provide a system for developing mentoring relationships
	*research success	*collaborate with an established researcher as junior author	*encourage senior/junior faculty collaboration
	*sense of belonging	*carry through with the first three activities	*reinforce the socialization process

TABLE 2 (CONT'D)

Career "Stage"	Career Events	Research-Related Activities: Faculty Member	Research-Related Activities: Administration and Peers
II. Initial Years	•short-term, specific goals	•"milk" dissertation for articles and presentations •allot time for research	•provide support services --secretarial --computer --assistant --lab facilities •reduce other demands
	•choice of mentor	•identify or continue with a mentor	•negotiate mentoring if needed
	•assistance from other faculty	•involve senior faculty in research agenda	•encourage junior-senior faculty collaboration •reward junior-senior faculty collaboration
	•develop research agenda in balance with other activities •develop research skills •self-assessment of research ability	•Keep research visible --provide departmental updates --join professional societies --attend and participate in professional meetings --attend workshops and seminars •examine success and direction of research agenda	•provide forum for visibility --faculty meetings --newsletters •encourage professional associations --attendance and participation at professional meetings --introduce to other researchers •encourage attendance at workshops and seminars on research topics --grant writing --writing organization •provide or refer for career counseling --balancing research demands with other demands --considering next steps --helping the unsuccessful or mismatched to "let go" and move on to other activities or another career

TABLE 2 (CONT'D)

Career "Stage"	Career Events	Research-Related Activities: Faculty Member	Research-Related Activities: Administration and Peers
III. Middle and Later Years	•develop multiple research agenda	•maintain colleague contacts --meetings --joint research --presentations --publications	•create and support environment conducive to multiple agenda --helping faculty "let go" of particular unfruitful research --help faculty generate necessary support services
	•mid-career assessment	•maintain and initiate research agendas consistent with personal/professional goals	•provide or facilitate career counseling --"becoming one's own person" --"generativity" vs "stagnation" --encourage efforts at renewal and redirection --help those who want to move into new areas to do so
	•continued literature citations	•produce at least 2-3 publications each year •secure grants to support research agenda	•encourage and reinforce continued research agenda
	•maintain research agenda within the framework of other institutional demands	•"let go" of other institutional events in order to devote time to research	•encourage others to take up available non-research activities
	•become a mentor	•seek out younger faculty interested in being mentored	•encourage collaborative research and sense of commitment to other professionals

Career "Stage"	Career Events	Research-Related Activities: Faculty Member	Research-Related Activities: Administration and Peers
IV. Retirement and Beyond	•adjusting to drastic role changes	•continue mentor role	•encourage continued participation --use as a resource for departmental continuity and perspective --provide space and support (secretarial and other) for continuing research
	•senior roles	•look at integrative roles	
		•develop a plan for transition to a less active role in the university	•provide or facilitate career counseling --determine meaningful activities --structuring time with meaningful activities
			•provide or facilitate financial counseling

D. Wheeler/J. Creswell 3/1985